

PLAN REVIEW CHECKLIST - NOTES

1. GENERAL - ALL PROJECTS

1.2 General

- (A) If the soil profile sheet includes the thickness of soil layers and top of boring elevations, sounding data does not have to be provided. This policy was adopted 1/4/00. As the soil profile sheets are produced following the new policy sounding data will not have to be included on the majority of projects. Projects for which the soil layers cannot be represented by the longitudinal section will still need sounding data. This will occur, for example, when borings are taken on both sides of a substructure unit.

3. FIRST SHEET OF DESIGN - ALL PROJECTS

3.1 General

- (A) The Iowa DNR has lowered the threshold for disturbed area from five acres to one acre effective March 10, 2003. All current projects being designed with disturbed areas over one acre need a Pollution Prevention Plan (PPP).

3.2 Specifications Notes

- (A) Examples of supplemental specifications to include if necessary:

~~"...including Supplemental Specifications for Modular Block Retaining Wall."~~

~~"...including Supplemental Specifications for Segmental Retaining Wall."~~

"...including Supplemental Specifications for Work On Railroad Right-of-Way (Burlington Northern and Santa Fe)."

~~"...including Supplemental Specifications for Concrete Drilled Shafts."~~

~~"...including Supplemental Specifications for Cleaning, Surface Preparation, and Painting of Galvanized Surfaces."~~

Examples of developmental specifications to include if necessary:

"...including Developmental Specifications for High Performance Concrete for Structures."

"...including Developmental Specifications for High Performance Concrete for Structures (Council Bluffs Interstate System)."

~~"...including Developmental Specifications for Mechanically Stabilized Earth (MSE) Retaining Wall."~~

"...including Developmental Specifications for Maintenance Work On Railroad Right-of-Way (Union Pacific)."

~~"...including Developmental Specifications for Quality Management - Structural Concrete (QM-SC)."~~

~~"...including Developmental Specifications for Removal of Concrete Box Girder Bridges."~~

~~"...including Developmental Specifications for High Performance Concrete for Prestressed Concrete Beams."~~

"...including Developmental Specifications for Colored Sealer Coating for Structural Concrete."

"...including Developmental Specifications for Improved Durability Concrete for Bridge Decks."

~~"...including Developmental Specifications for Disc Bearing Assembly."~~

~~"...Including Developmental Specifications for Precast Noise Wall."~~

~~"...including Developmental Specifications for Bridge Floor Over-Depth Repair and Overlay."~~

~~"...including Developmental Specifications for Concrete Drilled Shaft for Support Structures."~~

~~"... including Developmental Specification for Partial Depth Bridge Deck Patching."~~

Examples of special provisions to include if necessary:

"...including Special Provisions for Fabricated Bearing Assembly."

"...including Special Provisions for Mass Concrete - Control of Heat of Hydration."

- (B) Contact the Bridge Office if it is determined a special provision may be necessary. There are a large number of special provisions already written that may be adaptable to a new project. Follow the Requirements for Preparing and Submitting Special Provisions for State and Local Systems Projects posted on the Specifications Section internet site. Consultants will need to provide an electronic copy of the special provision when turning plans in for 100% unapproved review.

3.5 Estimate Reference Information Notes

3.5.2 Repair Projects

- (A) "Includes furnishing and placing concrete sealer"
- (B) "Includes xx CY (m³) of structural concrete and xx lb (kg) of epoxy coated reinforcing steel."
- (C) "Includes xx ft (m) of 2" (51 mm) Dia. and xx ft (m) of 1" (25 mm) diameter rigid steel conduit."
- (D) "All temporary barrier rail shall be nominal 12'-6 (4100 mm) long concrete units"
- (E) "All temporary barrier rail shall be nominal 20' (6 m) long steel units."
- (F) "Includes furnishing and placing subdrain including outlet, special backfill, granular backfill, and porous backfill. Includes cost of shoring during stage construction. No measurement will be made for subdrain outlet trench through the foreslope. Cost of excavating and backfilling outlet trench included in the work."
(barrier footings only) "Includes cost of furnishing and placing special backfill"
- (G) "Includes all preformed expansion joint filler required."
- (H) "Includes all preformed expansion joint filler required."
- (I) "Includes all mechanical splice assemblies required."

3.5.3 New Designs

- (A) "Includes furnishing and placing concrete sealer."
- (B) "Includes furnishing and placing subdrain (including excavation), granular backfill, porous backfill and subdrain outlet at abutments and toe of berm."
- (C) "Includes all preformed expansion joint filler required."
- (D) "Includes anchor bolts and plates at light pole bases."
- (E) "If precast prestressed concrete deck panels are used, the structural concrete quantity is reduced xx CY (m³)."

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- (F) "If precast prestressed concrete deck panels are used, the epoxy coated reinforcing steel quantity is reduced xx lb (kg)."
- (G) "Includes xx ft (m) of 2" (51 mm) Dia. and xx ft (m) of 1" (25 mm) Dia. rigid steel conduit."
- (H) "Includes material and labor associated with providing and installing rigid steel conduit, junction boxes and fittings."
- (I) "Includes all necessary hardware and accessories including the anchorage system, temporary erection material and the 3/8" (10 mm) barrier plates with their anchorage system."
- (J) Macadam - "Includes furnishing and placing engineering fabric, macadam stone, 4" x 6" (100 mm x 150 mm) treated timbers, 1/2" (12.7 mm) diameter steel pins (or rebars), porous backfill or granular subbase backfill at front face of abutment footing, and all required excavating, shaping and compacting."

Concrete - "Includes furnishing and placing engineering fabric, #15 rebars, porous backfill or granular subbase backfill at front face of abutment footing, and all required excavating, shaping and compacting."
- (K) "Includes xx deck drains at xx lb (kg) each."
- (L) "Includes pier and abutment bearing material."
- (M) "Includes anchored curved sole plates."
- (N) "Includes pile uplift anchors."

3.5.4 Steel Bridges

- (A) "Includes Girder Sole Plate, Bearing Rockers, Fixed Shoes, Bearing Masonry Plates, Swedge Anchors, Lead Sheet and Bronze Plate".

3.6 General Notes

3.6.1 All Projects

- (A) ~~"Place note E-109 'All coarse aggregate for structural concrete shall be crushed limestone' in the general notes for bridge projects located in District 1."~~

3.6.3 New Designs

- (A) ~~"Abutment piles shall not be driven for a minimum of xxx days following completion of the approach fills."
"The time period between approach fill completion and driving abutment pile may be increased as ordered by the Engineer based upon review of settlement plate results."~~

7. PIER DETAILS - NEW CONSTRUCTION

7.1 General

- (A) "Concrete sealer is to be applied to the top of piers in accordance with ~~the Standard Specifications article 2403.03, P. 3 of the Standard Specifications.~~"

7.3 Column

- (A) Note that epoxy coated spiral reinforcing is available. If development length of the column reinforcing into the cap is an issue the epoxy can be removed from the end of the bar that extends into the cap. Check with the section leader prior to detailing the plans with the epoxy coating stripped off the end of the reinforcing.

7.4 Footing

- (A) Batter all exterior pile for a footing at 4:1 if possible. Corner pile should be battered in the direction of the bisector of adjacent footing edges. If pile will interfere at 4:1 batter, try 6:1 batter. If pile will interfere at 6:1 batter, drop batter for that pile giving preference to the pile in an exterior column footing. The battered pile pattern for an individual footing should be symmetric.

8. ABUTMENT DETAILS - NEW CONSTRUCTION

8.2 Stub Abutments

- (A) "Concrete sealer shall be applied to the abutment bridge seat in accordance with ~~Standard Specification 2403.24 article 2403.03, P. 3 of the Standard Specifications.~~ In addition to the requirements of article ~~2403.24 2403.03, P. 3,~~ sealer shall be applied to the wash between the bridge seat steps."

9. SUPERSTRUCTURE DETAILS - GENERAL - NEW CONSTRUCTION

9.1 Typical Section

- (A) The following note placed inside of a box may be used: "Slab Area = XX.XX ft² (m²). Slab Area does not include the nominal X in (XX mm) haunch".

10. SUPERSTRUCTURE DETAILS - CWPG - NEW CONSTRUCTION

10.5 Deflection Diagram

- (A) Dimension from 'chord between abut. bearings' to 'top of web' shown as an individual value, in addition to the component dimensions, at the midpoint and ends of each girder segment (segment is considered end to splice or splice to splice). For example, if a positive camber is being provided, a dimension should be provided with the value being the sum of the 'chord to chord' and the 'chord to top of web' offset. The 'chord to chord' and the 'chord to top of web' offset dimensions would also be shown. For a negative or zero camber, the explicit dimension is generally provided by default. This has been requested by Materials since the camber (offset) is checked at the midpoint and ends of girder segments.

12. DETAILS - REPAIR/OVERLAY PROJECTS

12.3 Backwall Repair/Barrier Rail Footings

- (A) The cost of furnishing and placing subdrain (including excavation), granular backfill, porous backfill, and subdrain outlet is to be included in the price bid for "Excavation, Class 20. No extra payment will be made."
- (B) "Excavation for end sections shall be backfilled with special backfill."

"The cost of furnishing and placing special backfill is to be included in the price bid for "Excavation, Class 20. No extra payment will be made."

PRCN Appendix A

3.2.6.3 Berms

3.2.6.3.1 Slope

A bridge berm slope is generally normal to the bridge abutment, but also may be normal to a roadway or railroad under the bridge. Under normal situations the designer may make the following initial assumptions for berm slopes:

- For fill heights to 30 feet (9.000 m) from grade to toe of berm, the steepest berm slope may be taken as 2.5:1, horizontal to vertical.
- For fill heights from 30-40 feet (9.000 m-12.200 m), the steepest berm slope may be taken as 3:1.
- For fill heights greater than 40 feet (12.200 m), contact the Soils Design Section for an opinion of the acceptable berm slope.

However, the designer shall also consider the following special situations:

- For bridges located over streams and rivers in the western Iowa Loess Hills counties (See list in commentary.), and for bridges situated in meandered stream and river alluvial sites/environments statewide (See list in C3.2.9.1.), the designer should use a 3:1 berm slope with fill heights less than 30 feet (9.000 m) unless a steeper slope has previously been reviewed by the Soils Design Section. Note that bridges located over roads in upland Loess Hills areas are exempt from this shallower slope.
- For any fill heights greater than 30 feet (9.000 m) on either Loess Hills stream and river sites or meandered stream and river alluvial sites statewide (See list in C3.2.9.1.), the designer shall contact the Soils Design Section for an initial slope estimate.
- For bridges statewide located in areas with special, unusual, extremely variable, and/or questionable soil conditions, the designer shall contact the Soils Design Section for an initial slope estimate.

If steeper slopes are required, they may be accommodated by reinforced steepened slope (RSS) techniques, by lightweight fill techniques, and/or by soil remediation techniques such as intermediate foundation improvements (IFIs) or core-outs, but steeper slopes require full coordination with and design by the Soils Design Section.

The designer shall check the berm slope at all potential critical points along the berm. This will ensure that the required berm slope is provided anywhere on the berm.

Objects such as bridge piers and bridge berms can create a sight obstruction on the inside curve of a highway. Minimum sight distance is required based on curve radius, design speed, etc., measured along the centerline of the inside lane around the curve [OD DM 6D-4]. Bridge piers located at clear zones typically do not cause an obstruction. Bridge berms located at the edge of the shoulder and within or close to a horizontal curve need to be checked by the Office of Design to verify that the berm is not causing an obstruction. These bridges may need to be lengthened to accommodate sight distance.

3.2.6.3.2 Toe offset

To improve snow removal operations and storage and reduce maintenance costs for roadway grade-separation structures with no outside piers, it is desirable to design the finished grade of the berm toe 5 feet (1.524 m) from the edge of shoulder. A minimum of 4 feet (1.219 m) offset is acceptable for PPCB bridges if sufficient beam length remains to obtain the 4-foot (1.219-m) minimum from the edge of shoulder to the toe. Use the next beam increment for that span if the minimum offset cannot be achieved. For CWPG bridges, set the toe of berm at the 5-foot (1.524-m) offset location. For standard design bridges, insure that at-least minimum offsets are obtained.

3.2.6.3.3 Berm slope location table

The berm slope location table (BSLT) was created to provide the road contractor with additional information for constructing the bridge berms. A berm slope location table should be created for all new bridges, for replacement bridges with a significant amount of berm cut or fill, and for bridges for which the recoverable berm location table (RBLT) is required. In these cases, the BSLT should be placed on the situation plan. A BSLT is not required for bridge replacements or widenings, where only a small amount of berm shaping is needed. The BSLT table identifies three points (A1, A2, and A3) at the toe of each bridge berm and three points (B1, B2, and B3) at the top of berm. The stations for A and B points are referenced from bridge stationing. The offsets for A and B points are referenced from centerline approach roadway.

The B points are located along the centerline of approach roadway and 3 feet (0.914 m) from the outside edge of the bridge deck. Note that for skewed bridges the slope along centerline approach roadway will be flatter than the design slope.

Points A1 and A3 also are located 3 feet (0.914 m) from the outside edge of the bridge deck. Point A2 is located on the centerline approach roadway. Sometimes additional A points are needed to better define the toe of the berm, especially for bridges with skews greater than 15 degrees.

For roadway grade separation structures with no outside piers, A1, A2, and A3 are defined where the finished grade of the berm toe is located 5 feet (1.524 m) from the edge of shoulder unless otherwise noted on the preliminary bridge situation plan, minimum of 4 feet (1.219 m). The additional 5 feet (1.524 m) shall be extended at the same slope as the shoulder and is provided to improve snow removal operations and snow storage and reduce maintenance costs [Modified OD SRP RL-15], [BDM 3.2.6.3.2]. For roadway grade separation structures with side piers, A1, A2, and A3 are defined at the clear zone [OD SRP RL-13]. The designer can determine the elevations of A1, A2, and A3 from existing or proposed grade information for the roadway under the bridge and cross slopes of the pavement and shoulder. For a bridge over a stream, railroad, or urban roadway A1, A2, and A3 are defined where the toe of the berm meets the existing ground or proposed grade.

The designer should coordinate with the Office of Design to ensure that the BSLT information is incorporated in the grading plans. See also the standard bridge berm grading plan [Modified OD SRP RL-17], standard foreslope transition detail [OD RDD (Typical) 4303], and the example BSLT in the commentary for this article.

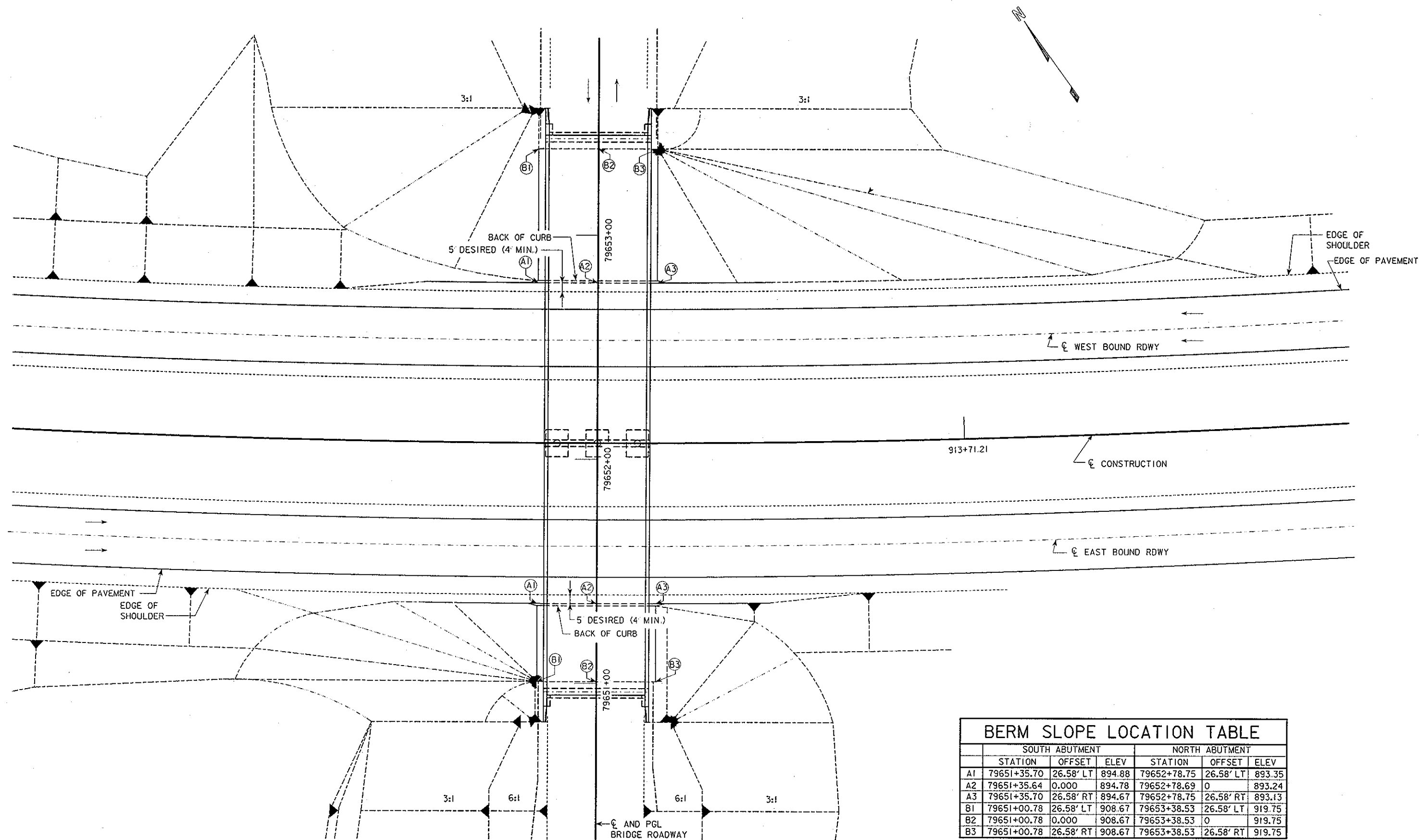
3.2.6.3.4 Recoverable berm location table

The recoverable berm is constructed for bridge berms with no outside piers; usually the berms are for a two-span overhead. A recoverable berm is created to provide a flattened slope for errant vehicles when the bridge berm is located in the clear zone. A recoverable berm location table (RBLT) should be created on the preliminary situation plan to provide bridge baseline station/offset and elevations for the various points in the table and to provide sufficient information for the contractor to construct the recoverable berm [Modified OD SRP RL-15].

The recoverable berm is represented by points B, C1, C2, and C3, as shown on [Modified OD SRP RL-15]. Point B is located 3 feet (0.914 m) from the outside edge of the bridge deck at the top of the bridge berm. In order to create the flattened area for the recoverable berm, a line must be established that is 15 degrees or less from the edge of the lane (traveled way) to point B. This will establish the line segment BC from point B to point C2, which should be at a 6:1 horizontal to vertical or flatter slope. If the slope is greater than 6:1, the angle from the lane to point B must be lowered to graphically determine the limits of the recoverable berm.

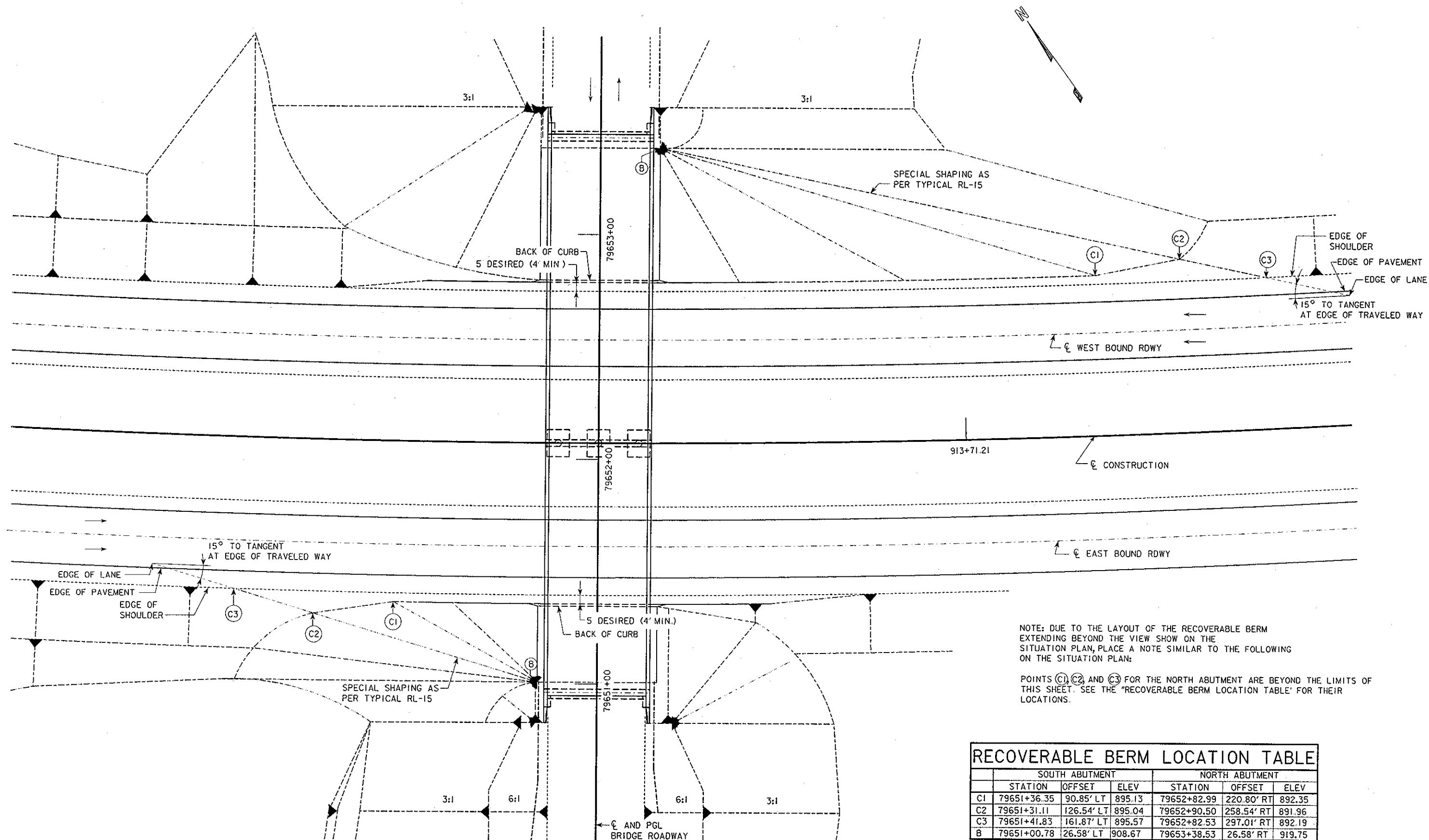
The line segment BC intersects the edge of the shoulder at point C3. The elevation of point C3 is the edge of the shoulder elevation at that location. Point C2 is on line BC and is located a distance equal to twice the shoulder width from the edge of the traveled way. Continuation of the shoulder slope to point C2 determines the elevation.

The station distance between point C2 and C3 is defined as "X". A station distance "X" toward the bridge should be applied to determine the location of point C1. Point C1 should be 5 feet (1.524 m) from the edge of the shoulder unless otherwise noted on the preliminary bridge situation plan, minimum of 4 feet (1.219 m).. See the standard road plan for bridge berms with no outside piers for more information [Modified OD SRP RL-15], [BDM 3.2.6.3.2]. The elevation of point C1 is based on a continuation of the shoulder slope to that location. Point C1 is established to provide a transition from the recoverable berm back to the normal toe of the bridge berm. See the example RBLT in the commentary for this article.



BERM SLOPE LOCATION TABLE						
	SOUTH ABUTMENT			NORTH ABUTMENT		
	STATION	OFFSET	ELEV	STATION	OFFSET	ELEV
A1	79651+35.70	26.58' LT	894.88	79652+78.75	26.58' LT	893.35
A2	79651+35.64	0.000	894.78	79652+78.69	0	893.24
A3	79651+35.70	26.58' RT	894.67	79652+78.75	26.58' RT	893.13
B1	79651+00.78	26.58' LT	908.67	79653+38.53	26.58' LT	919.75
B2	79651+00.78	0.000	908.67	79653+38.53	0	919.75
B3	79651+00.78	26.58' RT	908.67	79653+38.53	26.58' RT	919.75

EXAMPLE RL-17 BERM SLOPE LOCATION TABLE



EXAMPLE RL-15 RECOVERABLE BERM LOCATION TABLE